



CURRICULUM VITAE
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EDUCATION:

1974-1978	University of Michigan Medical School Ann Arbor, Michigan M.D.
1971-1974	University of Michigan Ann Arbor, Michigan Major: Microbiology

POSTGRADUATE TRAINING:

1984-1985	Research Fellowship in Pharmacokinetics University of California San Francisco, California
1983-1984 1982-1984	Chief Resident Anesthesiology Residency Virginia Mason Hospital Seattle, Washington
1978-1979	Flexible Internship United States Public Health Service Hospital San Francisco, California

UNIFORMED SERVICE:

1978-1981	Commissioned Corps U.S. Public Health Service Lieutenant 03
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APPENDIX I

PROFESSIONAL LICENSURE:

1997-Present	Massachusetts
1994-1998	North Carolina
1982-1995	Washington
1979-1986	California
1979-1982	Idaho

SPECIALTY CERTIFICATION:

1994	Certificate of Added Qualifications in Pain Management
1986	Anesthesiology Board Certification

EMPLOYMENT:

09/01- Present	Chief Executive Officer Sention, Inc Providence, RI
03/01- 09/01	Acting Chief Medical Officer Cypress BioScience, Inc San Diego, California
03/01- 09/01	Consultant, Adolor Corporation
06/00-03/01	Vice President, Clinical Research & Development
12/98-07/00	Vice President, Clinical Research & Development and Regulatory Affairs Adolor Corporation Exton, Pennsylvania
1998	Director, Clinical Research
1997	Associate Director, Clinical Research Astra USA, Westboro, Massachusetts and Astra Pain Control, Södertälje, Sweden
1998 -Present	Adjunct Associate Professor Department of Anesthesiology Duke University Medical Center Durham, North Carolina
1994-1997	Associate Professor Department of Anesthesia Bowman Gray School of Medicine of Wake Forest University Winston- Salem, North Carolina

1992-1994	Associate Clinical Professor of Anesthesiology
1985-1992	Assistant Clinical Professor of Anesthesiology University of Washington Medical Center and Affiliated Hospitals Seattle, Washington
1991	Sabbatical in Molecular Biology VMRC, University of Washington, Seattle, Washington
1985-1994	Anesthesia Faculty Virginia Mason Medical Center Seattle, Washington
1979-1981	Family Practice National Health Service Corps Idaho Migrant Council and Community Health Clinic Nampa, Idaho

OTHER PROFESSIONAL APPOINTMENTS AND ACTIVITIES:

BOWMAN GRAY SCHOOL OF MEDICINE

1996-1997	Member, Clinical Competence Committee
1996-1997	Member, Medical Student Education Committee
1996-1997	Member, Research Committee
1995-1997	Member, Anesthesia Finance Committee

VIRGINIA MASON MEDICAL CENTER

1991-1994	Chairman, Research Advisory Committee
1990-1994	Co-Chairman, Retirement Committee
1987-1994	Member, Anesthesia Resident Competency Committee
1987-1994	Director of Research, Anesthesiology Department
1989-1992	Member, Clinical Pharmacology Unit Committee
1989-1991	Chairman, Clinical Research Program Development
1989-1991	Member, Research Advisory Committee
1986-1989	Member, Intensive Care Unit Committee
1986-1988	Member, Respiratory Therapy Committee

EXTRAMURAL

	American Board of Anesthesiology
1995-1996	Committee on Scientific Papers
1995-1996	Member, Pain Management Examination Committee
1993, 1995	Question Writer, Exam for Certificate of Added Qualifications in Pain Management

1997	American Society of Anesthesiologists Member, Subcommittee on Drug Disposition and Anesthetic Action
1995-1996	Chair, Subcommittee on Drug Disposition and Anesthetic Action
1992, 1993	Member, Subcommittee on Local Anesthesia and Pain
1994-1997	American Society of Regional Anesthesia and Pain Medicine Board of Directors
1993-1996	Chairman, Research Committee
1990, 1992, 1996	Scientific Program Committee
1990-1993	Member, Research Committee

EDITORIAL SERVICES

1996-Present	<i>International Monitor</i> Editorial Advisory Board
1996-97	<i>Techniques in Regional Anesthesia and Pain Management</i> Editor
1995-1997	<i>Regional Anesthesia and Pain Medicine</i> Editor-In-Chief
1992-1995	Associate Editor
1988-1992	Consulting Editor
1992-1997	<i>Anesthesia & Analgesia</i> Guest Reviewer
1992-1996	<i>Anesthesiology</i> Associate Editor
1988-1992	Guest Reviewer
1995	<i>Clinical Anesthesia</i> Guest Reviewer

CONSULTATIVE SERVICES

1996-1997	Medical and Scientific Advisor for Development of Depomorphine - long acting morphine preparation Preclinical - Phase I (Depotech)
1995-1997	Medical and Scientific Advisor for Long-acting Local Anesthetic Drug Development Program Preclinical - Phase I (Purdue-Frederick)
1987-1997	Medical and Scientific Advisor for Anesthesia and Pain Management Drug Development Programs Preclinical - Phase IV (ASTRA)

1994	Scientific Advisor, Drug and Device Development Team for Treatment of Acute and Chronic Pain Management Phase I - II (Baxter Health Care Corporation)
1988-1993	Member of Scientific and Medical Advisory Board for Inhaled and Local Anesthetic Development Programs Preclinical (Anaquest)
1990	Expert Consultant at Ropivacaine FDA Advisory Committee Meeting (ASTRA)
1987	Scientific and Medical Advisor, A3217 - Novel Narcotic Preclinical - Phase I (Anaquest)
1986	Scientific and Medical Advisor and Inlicensing Consultant, Methoxyflurane Microdroplets Development Program Preclinical - Phase I (Anaquest)

TEACHING ACTIVITIES

Fellows	Robert C. Morell, MD Christopher M. Bernards, MD Daniel J. Kopacz, MD David C. Mackey, MD Jean Philippe Guinard. MD Spencer S. Liu, MD Andrew A. Chiu, MD
1985-1988	Instructor: Basic and Advanced Cardiac Life Support American Heart Association

GRANTS:

1997	Southern Medical Association, \$2,500 (Faculty Advisor) Does intrathecal morphine mimic the cardioprotective effect of ischemic preconditioning in the rat heart?
1995	Health Services Research Center Grant, \$5,994 (P.I.) Effect of analgesic technique on outcome, cost of care, and quality of life after colonic surgery
1993	ASTRA, \$110,000 (Coinvestigator) Dose response of ropivacaine for wound infiltration after inguinal herniorrhaphy
1993	Carl Koller Research Grant, \$12,000 (Faculty Advisor) Effect of analgesia upon outcome after colon surgery
1992	Abbott, \$14,000 (P.I.) Optimal concentration of bupivacaine in combination with fentanyl for epidural analgesia after thoracotomy

1992	ASTRA, \$65,000 (Coinvestigator) Pharmacokinetics and pharmacodynamics of ropivacaine for intercostal nerve blockade in volunteers
1992	Anaquest, \$75,000 (P.I.) Molecular Mechanisms of Spinal Neuronal Hypersensitivity
1991	Carl Koller Research Grant, \$8,000 (P.I.) Effects of intradermal formalin upon expression of preprotachykinin in the rat spinal cord
1991	Anaquest, \$54,000 (P.I.) Comparison of desflurane and isoflurane for anesthesia in the elderly
1991	Syntex, \$40,000 (P.I.) Comparison of ketorolac and fentanyl for analgesia
1990	Roche, \$55,000 (Coinvestigator) Dose response for flumazenil antagonism of midazolam
1989	ASTRA, \$48,000 (Coinvestigator) Comparison of ropivacaine and bupivacaine for epidural anesthesia in patients undergoing orthopedic surgery
1989	Anesthesia Patient Safety Foundation, \$30,680 (P.I.) Risk and Outcomes of Spinal Anesthesia
1987	Roche \$25,000 (P.I.) Effect of midazolam and diazepam on bupivacaine-induced cardiovascular toxicity in the pig
1987	Virginia Mason Research Grant, \$10,000 (P.I.) Effect of vasoconstrictors and local anesthetics upon capillary blood flow in humans
1987	ASTRA, \$24,000 (P.I.) Effects of ropivacaine on capillary blood flow and surgical bleeding in the pig
1986	Syntex, \$15,000 (Coinvestigator) Comparison of ketorolac and morphine to treat pain after abdominal hysterectomy
1982	Virginia Mason Research Grant, \$6,000 (P.I.) Effect of verapamil and lidocaine on pancuronium induced neuro-muscular blockade in the cat

HONORS AND AWARDS:

1987, 1994	L. Donald Bridenbaugh Anesthesia Faculty Teaching Award Virginia Mason Medical Center
1985	Second Prize, Resident Research Essay Contest American Society of Anesthesiologists
1975-78	USPHS Medical Scholarship
1971-75	Evans Scholarship

PROFESSIONAL MEMBERSHIPS:

American Pain Society
American Society of Anesthesiologists
American Society of Regional Anesthesia
International Association for the Study of Pain
International Anesthesia Research Society

BIBLIOGRAPHY

BOOK CHAPTERS:

1. Carpenter RL (contributor). *The Critical Care Drug Handbook*. 2nd ed., St. Louis: Mosby Year Book, 1997.
2. Carpenter RL. Regional anesthesia improves postoperative outcome. What further studies do we need? In: Van Zundert A, ed. *Highlights in Pain Therapy and Regional Anaesthesia*, V. Barcelona: Permanyer Publications, 1996:324-328.
3. Carpenter, RL. Spinal anesthesia. Effects on the circulation. In: Van Zundert A, ed. *Highlights in Pain Therapy and Regional Anaesthesia*, V. Barcelona: Permanyer Publications, 1996:172-177.
4. Carpenter, RL, Mackey D. Local anesthetics. In: Barash PG, Cullen BF, Stoelting RK, eds. *Clinical Anesthesia*, 3rd ed. Philadelphia: J.B. Lippincott Company, 1996.
5. Carpenter RL. Does outcome change with pain management? In: Barash PG, ed. *ASA Refresher Courses in Anesthesiology*. Philadelphia: J.B. Lippincott 1995;23:1-17.
6. Carpenter RL. Hematologic and immune function. In: Brown DL, ed. *Risk and Outcome in Anesthesia*, 2nd ed. Philadelphia: J.B. Lippincott Company, 1992.
7. Carpenter RL, Mackey D. Local anesthetics. In: Barash PG, Cullen BF, Stoelting RK, eds. *Clinical Anesthesia*, 2nd ed. Philadelphia: J.B. Lippincott Company, 1992.
8. Carpenter RL, Cullen BF. Hematologic and immune function. In: Brown DL, ed. *Risk and Outcome in Anesthesia*. Philadelphia: J.B. Lippincott Company, 1988.
9. Carpenter RL, Mackey D. Local anesthetics. In: Barash PG, Cullen BF, Stoelting RK, eds. *Clinical Anesthesia*. Philadelphia: J.B. Lippincott Company, 1988.

JOURNAL ARTICLES:

1. Taguchi A, Sharma N, Saleem RM, Sessler DI, Carpenter RL, Seyedsadr M, Kurz A. Selective postoperative inhibition of gastrointestinal opioid receptors. *N Engl J Med* 2001;345:935-40
2. Liu SS, Hodgson PS, Carpenter RL, Fricke JR Jr. ADL 8-2698, a trans-3,4-dimethyl-4-(3-hydroxyphenyl) Pharmacol Ther 2001;68:66-71
3. Cass G, Reynolds W, Lorenzen T, Leach D, Matson D, Carpenter R. Randomized double-blind study of the clinical duration and efficacy of Nesacaine-MPF 2% and 3% in peribulbar anesthesia. *J Cataract Refract Surg* 1999;25:1656-1661.
4. Groban L, Zvara DA, Deal DD, Vernon JC, Carpenter RL. Thoracic epidural anesthesia reduces infarct size in a canine model of myocardial ischemia and reperfusion injury. *J Cardiothorac Vasc Anesth* 1999;13:579-585.
5. Liu SS, Moore JM, Luo AM, Trautman WJ, Carpenter RL. Comparison of 3 solutions of ropivacaine/fentanyl for postoperative patient controlled epidural analgesia. *Anesthesiology* 1999;90:727-733.
6. Carpenter RL, Hogan Q, Liu SS, Crane B, Moore J. Lumbosacral cerebrospinal fluid volume is the primary determinant of sensory block extent and duration during spinal anesthesia. *Anesthesiology* 1998;89:24-29.
7. Carpenter RL. Optimizing postoperative pain management. *Am Fam Physician* 1997;56:835-844.
8. White PF, Joshi GP, Carpenter RL, Fragen RJ: A comparison of oral ketorolac and hydrocodone-acetaminophen for analgesia after ambulatory surgery: arthroscopy versus laparoscopic tubal ligation. *Anesth Analg* 1997;85:37-43
9. Carpenter RL, Abram SE, Bromage PR, Rauck RL. Consensus statement on acute pain management. *Reg Anesth* 1996;21:152-156.
10. Carpenter RL. Future directions for outcome research in acute pain management: design of clinical trials. *Reg Anesth* 1996;21:137-138.
11. Carpenter RL. Future epidural or subarachnoid analgesics: local anesthetics. *Reg Anesth* 1996;21:75-80.
12. Carpenter RL. Gastrointestinal benefits of regional anesthesia/analgesia. *Reg Anesth* 1996;21:13-17.
13. Gerancher JC, Carpenter RL. The peripheral nerve stimulator: a monitor during continuous spinal anesthesia. *Reg Anesth* 1996;21:480-481.

14. Naveira FA, Speight KL, Rauck RL, Carpenter RL. Meningitis after injection of intrathecal baclofen: A case report. *Anesth Analg* 1996;82:1297-1299.
15. Carpenter RL, Rauck RL. Refractory head and neck pain: a difficult problem and a new alternative therapy. (Editorial) *Anesthesiology* 1996;84:249-252.
16. Liu SS, Carpenter RL. Hemodynamic responses to intravascular injection of epinephrine-containing test doses in adults during general anesthesia. *Anesthesiology* 1996;84:81-87.
17. Liu SS, Gerancher JC, Bainton BG, Kopacz DJ, Carpenter RL. The effects of electrical stimulation at different frequencies on perception and pain in human volunteers: epidural versus intravenous administration of fentanyl. *Anesth Analg* 1996;82:98-102.
18. Carpenter RL. Hyperbaric lidocaine spinal anesthesia: do we need an alternative? (Editorial) *Anesth Analg* 1995;81:1125-8.
19. Liu SS, Carpenter RL, Mackey DC, Thirlby RC, Rupp SM, Shine TSJ, Feinglass NG, Metzger PP, Fulmer JT, Smith SL. Effects of perioperative analgesic technique on rate of recovery after colon surgery. *Anesthesiology* 1995;83:757-765.
20. Liu SS, Pollock JE, Mulroy MF, Allen HW, Neal JM, Carpenter RL. Comparison of 5% with dextrose, 1.5% with dextrose, and 1.5% dextrose-free lidocaine solutions for spinal anesthesia in human volunteers. *Anesth Analg* 1995;81:697-702.
21. Liu SS, Carpenter RL, Chiu AA, McGill TJ, Mantell SA. Epinephrine prolongs duration of local anesthetics in a dose-related manner: Correlation with magnitude and duration of vasoconstriction. *Reg Anesth* 1995;20:378-384.
22. Liu SS, Angel JM, Owens BD, Carpenter RL, Isabel L. Effects of epidural bupivacaine after thoracotomy. *Reg Anesth* 1995;20:303-310.
23. Levy BS, Carpenter RL. Perioperative pain management. *The Journal of the American Association of Gynecologic Laparoscopists* 1995;2:381-387.
24. Liu SS, Carpenter RL, Neal JM. Epidural anesthesia and analgesia: their role in postoperative outcome. (Review) *Anesthesiology* 1995;82:1474-1506.
25. Liu SS, Chiu AA, Neal JM, Carpenter RL, Bainton BG, Gerancher JC. Oral clonidine prolongs lidocaine spinal anesthesia in human volunteers. *Anesthesiology* 1995;82:1353-1359.
26. Guinard JP, Mulroy MF, Carpenter RL. Aging reduces the reliability of epidural epinephrine test doses. *Reg Anesth* 1995;20:193-198.
27. Liu SS, Carpenter RL, Weissman RM, Mulroy MF, Owens BD, Olsson GL, Rupp SM, Allen HW, Kopacz DJ. Intravenous versus epidural administration of hydromorphone: Effects on analgesia and recovery after radical retropubic prostatectomy. *Anesthesiology* 1995;82:682-688.
28. Liu SS, Chiu A, Carpenter RL, Mulroy MF, Allen HW, Neal JM, Pollock JE. Fentanyl prolongs lidocaine spinal anesthesia without prolonging recovery. *Anesth Analg* 1995;80:730-734.
29. Chiu A, Liu SS, Carpenter RL, Neal JM, Pollock JE. The effects of epinephrine on lidocaine spinal anesthesia: a cross-over study. *Anesth Analg* 1995;80:735-739.
30. Liu SS, Paul GE, Carpenter RL, Wu R. Prolonged P-R interval is a risk factor for bradycardia during spinal anesthesia. *Reg Anesth* 1995;20:41-44.
31. Liu SS, Kopacz DJ, Carpenter RL. Quantitative assessment of differential sensory nerve block after lidocaine spinal anesthesia. *Anesthesiology* 1995;82:60-63.
32. Guinard JP, Carpenter RL, Chassot PG. Epidural and intravenous fentanyl produce equivalent effects during major surgery. *Anesthesiology* 1995;82:377-382.
33. Kopacz DJ, Emanuelsson BM, Thompson GE, Carpenter RL, Stephenson C. Pharmacokinetics of ropivacaine and bupivacaine for bilateral intercostal blockade in healthy male volunteers. *Anesthesiology* 1994;81:1139-1148.
34. Wong HY, Carpenter RL, Kopacz DJ, Fragen RJ, Thompson GE, Maneatis TJ, Bynum LJ, Shefrin AP, Digiorio EL. A randomized, double-blind evaluation of ketorolac tromethamine for post-operative analgesia in ambulatory surgery patients. *Anesthesiology* 1993;78:6-14.

35. Guinard JP, Chiolero R, Mavrocordatos P, Carpenter RL. Prolonged intrathecal fentanyl analgesia via 32G catheters after thoracotomy. *Anesth Analg* 1993;77:936-941.
36. Guinard JP, Carpenter RL, Smith HS. A prospective evaluation of the failure rate of spinal anaesthesia for transurethral prostatic resection. *Eur J Anaesth* 1992;9:7-13.
37. Carpenter RL, Caplan RA, Brown DL, Stephenson CA, Wu R. Incidence and risk factors for side effects of spinal anesthesia. *Anesthesiology* 1992;76:906-916.
38. Guinard JP, Carpenter RL, Morell RC. Effect of local anesthetic concentration on capillary blood flow in man. *Reg Anesth* 1992;17:317-321.
39. Bodily MN, Carpenter RL, Owens BD. Lidocaine 0.5% spinal anaesthesia: a hypobaric solution for short stay perirectal surgery. *Can J Anaesth* 1992;39:770-773.
40. Guinard JP, Mavrocordatos P, Chiolero R, Carpenter RL. A randomized comparison of intravenous versus lumbar and thoracic epidural fentanyl for analgesia after thoracotomy. *Anesthesiology* 1992;77:1108-1115.
41. Millay DJ, Larraabee WF, Jr, Carpenter RL. Vasoconstrictors in facial plastic surgery. *Arch Otolaryngol Head Neck Surg* 1991;117:160-163.
42. Strum DP, Eger EI, Unadkat JD, Johnson BH, Carpenter RL. Age affects the pharmacokinetics of inhaled anesthetics in humans. *Anesth Analg* 1991;73:310-318.
43. Guinard JP, Carpenter RL, Owens BD, Nadir B. Comparison between ropivacaine and bupivacaine after subcutaneous injection in pigs: cutaneous blood flow and surgical bleeding. *Reg Anesth* 1991;16:268-271.
44. Brown DL, Carpenter, Thompson GE. Comparison of 0.5% ropivacaine and 0.5% bupivacaine for epidural anesthesia in patients undergoing lower extremity surgery. *Anesthesiology* 1990;72:633-636.
45. Brown DL, Carpenter RL. Perioperative analgesia: a review of risk and benefit. *J Cardiothorac Anesth* 1990;4:368-383.
46. Johnson PW, Carpenter RL. Temporary increase in leg pain resulting from lumbar sympathetic blockade. *Pain* 1990;42:201-203.
47. Guinard JP, Mulroy MF, Carpenter RL, Knopes KD. Test doses: optimal epinephrine content with and without acute beta-adrenergic blockade. *Anesthesiology* 1990;73:386-392.
48. Kopacz DJ, Carpenter RL, Mulroy MF. The reliability of epidural anesthesia for repeat ESWL: a study of changes in epidural compliance. *Reg Anesth* 1990; 15:199-203.
49. McMahon DJ, Carpenter RL. A comparison of conductivity-based hematocrit determinations with conventional laboratory methods in autologous blood transfusions. *Anesth Analg* 1990;71:541-544.
50. Brown DL, Carpenter RL. Aspirin (other platelet active drugs) and regional anesthesia. *Survey of Anesthesiology* 1990;34:420-427.
51. Carpenter RL, Kopacz DJ, Mackey DC. Accuracy of laser Doppler capillary flow measurements for predicting blood loss from skin incisions in pigs. *Anesth Analg* 1989;68:308-311.
52. Carpenter RL, Eger EI II. Alveolar-to-arterial-to-venous anesthetic partial pressure differences in humans. *Anesthesiology* 1989;70:630-635.
53. Bernards CM, Carpenter RL, Rupp SM, Brown DL, Morse BV, Morell RC, Thompson GE. Effect of midazolam and diazepam premedication on central nervous system and cardiovascular toxicity of bupivacaine in pigs. *Anesthesiology* 1989;70:318-323.
54. Mackey DC, Carpenter RL, Thompson GE, Brown DL, Bodily MN. Bradycardia and asystole during spinal anesthesia: a report of three cases without morbidity. *Anesthesiology* 1989;70:866-868.
55. Carpenter RL, Smith HS, Bridenbaugh LD. Epinephrine increases the effectiveness of tetracaine spinal anesthesia. *Anesthesiology* 1989;71:33-36.
56. Kopacz DJ, Carpenter RL, Mackey DC. Effect of ropivacaine on cutaneous capillary blood flow in pigs. *Anesthesiology* 1989;71:69-74.
57. Bernards CM, Carpenter RL, Kenter ME, Brown DL, Rupp SM, Thompson GE. Effect of epinephrine on central nervous system and cardiovascular system toxicity of bupivacaine in pigs. *Anesthesiology* 1989;71:711-717.
58. Price SL, Brown DL, Carpenter RL, Unadkat JD, Crosby SS. Isoflurane elimination via bubble oxygenator during extracorporeal circulation. *J Cardiothorac Anesth* 1988;2:41-44.

59. Carpenter RL. How to optimize the success rate of spinal anesthesia. *Problems in Anesthesia*. 1987;1:539-548.
60. Carpenter RL, Eger EI, Johnson BH, Unadkat JD, Sheiner LB. Does the duration of anesthetic administration affect the pharmacokinetics or metabolism of inhaled anesthetics in humans? *Anesth Analg* 1987;66:1-8.
61. Carpenter RL, Eger EI, Johnson BH, Unadkat J, Sheiner LB. The extent of metabolism of inhaled anesthetics in humans. *Anesthesiology* 1986;65:201-205
62. Carpenter RL, Mulroy MF. Edrophonium antagonizes combined lidocaine-pancuronium and verapamil-pancuronium neuromuscular blockade in cats. *Anesthesiology* 1986;65:506-510.
63. Carpenter RL, Eger EI, Johnson BH, Unadkat JD, Sheiner LB. Pharmacokinetics of inhaled anesthetics in humans: measurements during and after the simultaneous administration of enflurane, halothane, isoflurane, methoxyflurane, and nitrous oxide. *Anesth Analg*. 1986;65:575-582.

LETTERS, OTHERS:

1. Price J M, Carpenter RL. Anesthesia Safety, Outcomes, and Prospective Study Design. (Letter) *Anesthesiology* 1998;89:790-791.
2. Carpenter RL. Local anesthetic toxicity: The case for ropivacaine. *Am J Anesthesiology* 1997;5S:4-7.
3. Carpenter RL. ADL 8-2698, a gut selective mu-antagonist drug for treatment of prevention of narcotic induced constipation and G.I. side effects; value in treating pain and addiction. *Problems of Drug Dependence* 2000, NIDA Res Monograph 181:68-70, 2000.
4. Carpenter RL. Opioid bowel dysfunction. Eastern Pain Association Scientific Meeting, New York City, NY, December 8, 2000.
5. Kurz, A., Taguchi, A., Sharma, N., Carpenter, R. L., Suntrup, P., Garver, D. D., Seyedsadr, M., and Schmidt, W. K.: Evaluation of ADL 8-2698, a novel GI-tract restricted opioid antagonist, for management of postoperative ileus (POI) and opioid-induced bowel dysfunction (OBD). Scientific and Educational Exhibit, American Society of Anesthesiologists, New Orleans, LA, October 14-16, 2001.

ABSTRACTS:

1. Rauck RL, Southern JP, Carpenter RL. Use of alvimopan, a peripherally restricted μ -opioid antagonist, to speed gastrointestinal transit in patients with opioid induced bowel dysfunction. 10th World Congress on Pain, San Diego, CA, August 17-22, 2002.
2. Paulson DM, Kennedy DT, Panebianco DI, Talluri K, Carpenter RL. A forced titration, dose ranging study of alvimopan for the reversal of opioid-induced bowel dysfunction. 10th World Congress on Pain, San Diego, CA, August 17-22, 2002.
3. Liberto JG, Herschler JA, Jaffe JH, Norbeck JH, Carpenter RL. Effects of ADL 8-2698, a peripherally restricted mu opioid antagonist, on gut motility in methadone and LAAM-dependent patients with opioid-induced constipation: A dose-ranging study. *Drug Alcohol Depend* 63: S91, 2001.
4. Hasson AL, Donovan R, Ling W, Carpenter R, Rawson RA, George D. Reversal of opioid-induced gastrointestinal dysfunction in patients receiving chronic opioid therapy using ADL 8-2698 a mu-opioid antagonist. *Drug Alcohol Depend*. 63: S63-S64, 2001.
5. Sharma N, Taguchi A, Arkilic CF, Saleem RM, Sessler DI, Carpenter RL, Kurz A. A novel μ -opioid antagonist (ADL 8-2698) shortens the duration of postoperative ileus and hospitalization. Presented at the Post-Graduate Assembly; December 9, 2000; New York, NY.
6. Barr WH, Nguyen P, Slattery M, Russel R, Carpenter RL. ADL 8-2698 reverses opioid induced delay in colonic transit. *Clin Pharm Ther* 67: 91, 2000
7. Hodgson PS, Liu SS, Carpenter, RL. ADL 8-2698 prevents morphine inhibition of GI transit. *Clin Pharm Ther* 67: 93, 2000.

8. Fricke JR, Lindquist D, Carpenter, RL. ADL 8-2698 does not antagonize opioid analgesia. Clin Pharm Ther 67: 93, 2000.
9. Groban L, Zvara DA, Deal DD, Vernon JC, Carpenter RL. Thoracic epidural anesthesia prevents noradrenergic surges and reduces infarct size in a canine model of severe myocardial, ischemia and reperfusion injury. Anesthesiology 1997;87:A823
10. Groban L, Zvara DA, Deal DD, Vernon JC, Carpenter RL. Thoracic epidural anesthesia attenuates reperfusion hyperemia in the ischemic canine myocardium. Anesthesiology 1997;87:A551
11. Carpenter R, Hogan Q, Liu S, Crane B. Spinal CSF volume is the primary determinant of sensory block height and duration of spinal anesthesia. Anesthesiology 1996;85:A736.
12. Liu S, Mulroy M, Neal J, Pollock J, Carpenter R. Fentanyl prolongs lidocaine spinal anesthesia. Anesth Analg 1995;80:S285.
13. Liu S, Carpenter R, Thirlby R. Effects of perioperative analgesia on rate of recovery after colon surgery. Anesthesiology 1995;83:A833.
14. Liu S, Chiu A, Neal J, Carpenter R. Oral clonidine prolongs spinal anesthesia in human volunteers. Anesthesiology 1995;83:A779.
15. Liu S, Carpenter RL, Neal JM, Pollock JE, Gerancher JC. Effects of addition of 20 µg of fentanyl to lidocaine spinal anesthesia. Reg Anesth 1995;20(2S):112.
16. Liu S, Carpenter RL, Mulroy MF, Rupp SM. Analgesic technique affects rate of recovery after colonic surgery. Reg Anesth 1995;20(2S):9.
17. Liu S, Kopacz DJ, Carpenter RL. Quantitative assessment of differential nerve blockade during spinal anesthesia. Anesth Analg 1995;80:S284.
18. Liu S, McGill T, Carpenter RL. Baseline blood pressure in regional anesthesia: Does it exist? Reg Anesth 1994;19(2S):94.
19. Mulroy MF, Burgess FW, Carpenter RL, Emanuelsson BM, Stephenson DA. Ropivacaine for postoperative wound infiltration after herniorrhaphy. Anesthesiology 1994;81:A1014.
20. Liu S, Angel J, Owens BD, Carpenter RL. 0.05% Bupivacaine is an optimal concentration for use with fentanyl for postthoracotomy analgesia. Anesthesiology 1994;81:A975.
21. Liu S, Carpenter RL, McGill TJ, Chiu AA, Mantell SA. Epinephrine prolongs duration of analgesia after infiltration of local anesthetics in a dose related manner. Anesthesiology 1994;81:A997.
22. Chiu AA, Liu S, Carpenter RL, Pollock JE, Neal JM. Crossover study of lidocaine spinal anesthesia with and without epinephrine. Anesthesiology 1994;81:A999
23. Carpenter RL, Liu S, Mulroy MF, Weissman RM, Olsson GL. Multimodal approach to optimize recovery shortens time to discharge after radical retropubic prostatectomy. Anesthesiology 1994;81:A1025.
24. Carpenter RL, Liu S, Mulroy MF, Weissman RM, McGill TJ. Epidural hydromorphone produces selective spinal analgesia. Anesthesiology 1994;81:A976.
25. Goldberg WL, Roos PK, Mulroy MF, Carpenter RL, Kopacz DJ. Procaine leads to earlier discharge times than lidocaine for outpatient spinal anesthesia. SAMBA Annual Meeting, 1993.
26. Roos PK, Fundis K, Mulroy MF, Allen HW, Carpenter RL. Regional versus general anesthesia for outpatient hand surgery. SAMBA Annual Meeting, 1993.
27. Swisher JL, Carpenter RL. A formalin model of inflammatory hyperalgesia produces unilateral dorsal horn elevations in preprotachykinin. Reg Anesth 1993;18:(2S)59.
28. Carpenter RL, Paul GE, Stephenson C. Is it possible to accurately identify baseline hemodynamic variables prior to anesthesia? Anesthesiology 1993;79:A1089.
29. Paul GE, Carpenter RL, Stephenson C, Wu R. Prolonged PR interval associated with increased incidence of bradycardia during spinal anesthesia. Anesthesiology 1993;79:A1086.
30. Kopacz DJ, Emanuelsson BM, Thompson GE, Stephenson CA, Carpenter RL. A pharmacokinetic comparison of ropivacaine and bupivacaine for intercostal blockade in volunteers. Anesthesiology 1993;79:A892.
31. Swisher JL, Carpenter RL. A formalin model of inflammatory hyperalgesia in the rat produces unilateral dorsal horn elevation of preprotachykinin mRNA. Anesthesiology 1993;79:A905.

32. Allen HW, Mulroy MF, Fundis K, Carpenter RL. Regional versus propofol general anesthesia for outpatient hand surgery. *Anesthesiology* 1993;79:A1.
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LECTURES, SPEECHES, EXHIBITS, FILMS:

VISITING PROFESSOR:

Brigham and Women's, Harvard, Boston, Massachusetts, December 10, 1997
McGill University, Montreal, Canada, March 10, 1997
Université de Montréal, Montreal, Canada, March 11, 1997
New York University, New York, New York, March 4-5, 1997
University of North Carolina, Chapel Hill, North Carolina, January 28-29, 1997
University of California-San Diego, San Diego, California, January 23-25, 1997
Hvidovre University Hospital, Copenhagen, Denmark, September 12, 1996
Mayo Clinic, Jacksonville, Florida, August 26, 1996
New York Hospital-Cornell Medical Center, New York, New York, May 15, 1996
University of Virginia, Charlottesville, Virginia, March 13, 1996
Hamamatsu University Hospital, Hamamatsu, Japan, April 12, 1995
Kyoto University Hospital, Kyoto, Japan, April 10, 1995
Karolinska Institutet, Stockholm, Sweden, August 29, 1994
Hahnemann University, Philadelphia, Pennsylvania, April 26, 1994
University of Arizona, Maricopa Medical Center, Phoenix, Arizona, March 23-24, 1994
Duke University Medical Center, Durham, North Carolina, March 16, 1994
Bowman-Gray School of Medicine, Winston-Salem, North Carolina, March 14-16, 1994
Yale University, New Haven, Connecticut, January 25-26, 1994
Louisiana State University, Shreveport, Louisiana, January 24, 1994

Mayo Clinic Jacksonville, Florida, June 7, 1993

Mayo Clinic, Rochester, Minnesota, September 3-5, 1991

Hospital for Special Surgery, Cornell Medical School, New York, New York, December 20, 1990

University of Oregon Health Sciences Center Portland, Oregon, September 28, 1990

INVITED NATIONAL LECTURES:

"Opioid Bowel Dysfunction." Eastern Pain Association Annual Meeting. New York, New York, December 8, 2000.

"ADL 8-2698, a gut-selective mu antagonist drug for treatment and prevention of narcotic-induced constipation and G.I. side effects; value in treating pain and addiction." College on Problems of Drug Dependence, Annual Meeting, San Juan, Puerto Rico, June 21, 2000.

Perspectives on Relationships Between Anesthesiology and Industry: Perspective of the Sponsor" American Society of Anesthesiologists Annual Meeting. Dallas, Texas, October 11, 1999.

"The Future of Spinal Anesthesia" and "Postoperative Pain Management: Current Update, Future Speculation" Sleepless in Seattle: Regional Anesthesia 1997. Virginia Mason Medical Center, Seattle, Washington, August 1-3, 1997.

"Modalities of Pain Control: Outcome." Advances in Pain Management. Cleveland Clinic, Cleveland, Ohio, May 20, 1997.

"Lidocaine is an Appropriate Spinal Anesthetic." American Society of Regional Anesthesia Annual Meeting, Atlanta, Georgia, April 10, 1997.

"Acute Pain Management: Effect on Patient Outcome" and "New Concepts in Spinal Anesthesia." Idaho State Society of Anesthesia Annual Meeting, Sun Valley, Idaho, March 1-2, 1997.

"Effect of Acute Pain Management on Patient Outcome." American Society of Health-System Pharmacists Mid-Year Clinical Meeting. New Orleans, Louisiana, December 10, 1996.

"Epidural Opioids and Pre-emptive Analgesia" and "Advances in Physiology and Pharmacology in Anesthesia and Critical Care 1996." Greenbrier, West Virginia, November 4, 1996.

"Does Outcome Change With Pain Management?" and "Selecting the Local Anesthetic, Baricity, and Additives for Spinal Anesthesia." Refresher Course, American Society of Anesthesiologists Annual Meeting, New Orleans, Louisiana, October 19, 1996.

"Does Acute Pain Management Improve Patient Outcome?" and "An Update on the Risks of Spinal Anesthesia." Regional Refresher Course, American Society of Anesthesiologists, San Francisco, California, June 29-30, 1996.

"Benefits of Regional Anesthesia/Analgesia: Gastrointestinal" and "Future Epidural or Intrathecal Analgesics: Local Anesthetics" and "Future Directions for Outcome Research in Acute Pain Management: Design of Clinical Trials." Future Directions of Acute Pain Management, The American Society of Regional Anesthesia, Orlando, Florida, May 31-June 2, 1996.

"Resident Education, Old Days vs. Today." American Society of Regional Anesthesia Annual Meeting, San Diego, California, March 29, 1996.

"New Local Anesthetics (EMLA, Ropivacaine)" and "Pre-emptive Analgesia." Comprehensive Review of Pain Management, The American Society of Regional Anesthesia, New Orleans, Louisiana, November 16, 1995.

"The Pharmacology of Local Anesthetics" and "Subarachnoid Block and Cardiac Arrest." Inaugural Meeting of "Advances in Physiology and Pharmacology in Anesthesia and Critical Care 1995," Asheville, North Carolina, October 29, and November 1, 1995.

"Does Outcome Change With Pain Management?" and "Regional vs. General Anesthesia." Refresher Course, American Society of Anesthesiologists Annual Meeting, Atlanta, Georgia, October 22-24, 1995.

"Pre-emptive Analgesia." Focus Session. American Society of Regional Anesthesia Annual Meeting, Orlando, Florida, March 30, 1995.

"Alternative Medical Pain Management." Society of Critical Care Medicine Annual Meeting, San Francisco, California, February 2, 1995.

"Does Outcome Change With Pain Management?" Refresher Course, American Society of Anesthesiologists Annual Meeting, San Francisco, California, October 15, 1994.

- “Designing a Clinical Study from Hypothesis to Submission” and “Pre-emptive Analgesia - Does It Exist? Does It Matter?” American Society of Regional Anesthesia Annual Meeting, Chicago, Illinois, April 7-8, 1994.
- “Pharmacology of Pain Hypersensitivity” and “New Developments in Analgesic Therapy.” Associates of Clinical Pharmacology Annual Meeting, San Antonio, Texas, March 25, 1994.
- “How to Get Your Paper Published” and “What We Have Learned About Spinals/Epidurals: Incidence of Bradycardia.” American Society of Regional Anesthesia Annual Meeting, Seattle, Washington, May 14-15, 1993.
- “Ropivacaine - Will It Replace Bupivacaine?” Update on Regional Anesthesia and Local Anesthetics, New York Post Graduate Assembly, New York, New York, December 12, 1992.
- “Molecular Mechanisms of Pain Transmission” and “Pre-emptive Analgesia - Fable or Fact.” Innovative Pain Management Strategies, American Society of Regional Anesthesia Workshop, San Diego, California, December 5-6, 1992.
- “Modulation of Pain Transmission at the Spinal Cord.” Seafair XIII, Scientific Program, Seattle, Washington, August 1, 1992.
- “Research Design Workshop.” American Society of Regional Anesthesia Annual Meeting, Tampa, Florida, March 28, 1992.
- “What Is the Risk of Spinal Anesthesia?” and “Ropivacaine.” Seafair XII, Scientific Program, Seattle, Washington, July 26-27, 1991.
- “Modulation of Pain Transmission in the Dorsal Horn.” Advances in Acute Pain Management, American Pain Society Annual Meeting, New Orleans, Louisiana, November 7, 1991.
- “Toxicity of Local Anesthetics” and “Pharmacology of Local Anesthetics.” Anesthesiology Review Course, University of California, San Diego, San Diego, California, May 15, 1991.
- “Local Anesthetics: Clinical Correlates,” “Risks of Spinal Anesthesia: A Surveillance Study,” and “Research Design Workshop.” Refresher Course, American Society of Regional Anesthesia Annual Meeting, Cincinnati, Ohio, April 4-6, 1991.
- “Adverse Cardiovascular Effects of Spinal Anesthesia: Who is at Risk?” American Society of Anesthesiologists Annual Meeting, New Orleans, Louisiana, October 16, 1989.
- “Effect of Aging on the Pharmacokinetics and Pharmacodynamics of Inhaled Anesthetics.” Seafair XI, Scientific Program, Seattle, Washington, July 29, 1989.
- “Vascular Effects of Local Anesthetics.” American Society of Regional Anesthesia Annual Meeting, Boston, Massachusetts, April 1, 1989.
- “Current Understanding of Local Anesthetics and Toxicity.” Seafair X, Seattle, Washington, July 30, 1988.
- “Spinal Anesthesia: The Risk of Not Adding Epinephrine.” Seafair IX, Seattle, Washington, July 25, 1987.
- “Vasopressors in Regional Anesthesia.” Refresher Course, American Society of Regional Anesthesia Annual Meeting, Lake Buena Vista, Florida, March 26, 1987.
- “Adjuvants of Regional Block Techniques: Epinephrine.” Seafair VIII, Scientific Program, Seattle, Washington, July 25, 1986.

INVITED INTERNATIONAL LECTURES:

- “The Current Status of Xylocaine for Spinal Anesthesia.” Nobel Forum, Karolinska Institutet, Stockholm, Sweden, September 24, 1997.
- “Postoperative Pain Management Improves Patient Outcome.” Montreal Society of Anaesthetists, Montreal, Canada, March 10, 1997.
- “Spinal Anesthesia: Effects on the Circulation” and “Regional Anesthesia Improves Postoperative Outcome: What Further Studies Do We Need?” European Society of Regional Anaesthesia XV Annual Meeting, Nice, France, September 18-21, 1996.
- “Does Acute Pain Management Affect Patient Outcome?” Canadian Anesthesiologists’ Society 53rd Annual Meeting, Montreal, Quebec, June 16, 1996.

- “Physiology & Pharmacology of Regional Blockade: Target: Spinal Cord” and “Current Topics in Spinal Anaesthesia: Managing the Circulation” and “Post-Operative Outcome Improvement after Regional Anaesthesia.” International Symposium on Regional Anesthesia, Auckland, New Zealand, April 9-10, 1996.
- “Intercostal, Interpleural Blocks, and Thoracic Sympathetic Block” and “Polimodal and Pre-emptive Analgesia: Clinical Implications.” II Simposio Panamericano De Anestesia Regional, Santiago, Chile, November 9-12, 1995.
- “Role of Epidural Analgesia in Postoperative Pain Management.” Japan Society of Anesthesia, 42nd Annual Meeting, Hamamatsu, Japan, April 19, 1995.
- “Molecular Mechanisms of Pain Hypersensitivity.” Department of Clinical Pharmacology, Karolinska Institute, Huddinge Hospital, Stockholm, Sweden, August 29, 1994.
- “Molecular Mechanisms of Pain Sensitivity/Pre-emptive Analgesia.” Australasian College of Anaesthetists, Melbourne, Australia, September 22, 1993.
- “Physiology of Neuraxial Blockade” and “Spinal Anesthesia - Complications and Risk Factors” and “Ropivacaine - Advantages and Clinical Perspectives” and “Pre-emptive Analgesia.” Simposio Anestesia Regional, Santiago, Chile, March 12-14, 1993.
- “Ropivacaine Present Status and Experimental Advantages” and “Perioperative Pain Control - The Role of Pre-emptive Analgesia” and “Recent Advances in the Mechanism of Action and Toxicity of Local Anesthetics.” Pan American Symposium on Regional Anesthesia, Sao Paulo, Brazil, March 4-5, 1993

PATENTS:

Farrar JJ, Schied P, Schmidt WK, Carpenter RL, “Methods for the Treatment and Prevention of Ileus,” U.S. Patent 6,469,030 B2, 22 October 2002.